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AVIATORS, AIR COMBAT,
AND COMBAT STRESS:
AN AIR FORCE COMMANDER'S PRIMER

BY

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**AVIATORS, AIR COMBAT, AND COMBAT STRESS:
AN AIR FORCE COMMANDER'S PRIMER**

AN INDIVIDUAL STUDY PROJECT

by

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INTRODUCTION

Countless minor incidents -- the kind you can never really foresee -- combine to lower the general level of performance, so that one always falls far short of the intended goal. Iron will-power can overcome this friction; it pulverizes every obstacle, but of course it wears down the machine as well.

Carl von Clausewitz, On War

Few aspects of modern warfare have attracted as much attention in recent years as does the use of airpower. Considerable controversy exists regarding airpower's strategic aims, conduct, costs, results, and morality. Historians, politicians, public figures, veterans, and religious leaders have argued over these issues almost non-stop since the dawn of aerial combat. Recent events in the Persian Gulf have reinvigorated this dialogue even more.

On one subject, however, there seems to be less debate and acrimony. When it comes to remembering the human contribution and sacrifice of thousands of aircrew and ground-support veterans, few people disagree. The American servicemen and women who participated in the world's various strategic aerial campaigns are widely acknowledged to have endured as much hardship and made as many sacrifices as any

group of combatants in modern warfare. This is true for almost any period of aviation history.

During the Second World War, for example, U.S. airmen carried the war offensively to Nazi Germany at a time when the Allies lacked any other means of defeating the enemy, and they would do so almost alone for two full years. Stepping away from the moral issues -- which frankly seem far more prominent now than they did at the time -- and considering only the efficacy of the campaign, it would seem indisputable that airpower played one of the decisive roles in the outcome of the war. A strong argument can be made that it measurably shortened the conflict.¹

A similar, if somewhat more limited, set of achievements came during the Korean War. For three years U.S. airpower effectively offset the massive ground superiority of the Red Chinese. United Nations air forces flew over one million sorties and dropped more than 475,000 tons of ordnance.² The skies over the Korean peninsula were unquestionably dominated by U.S.A.F. pilots, whose equipment and training helped them to terrifically high kill-ratios.³

The achievements of U.S. airpower during the long war in Southeast Asia were more problematical and less easy to determine. Simply stated, American political uncertainty over the goals of the war, led, in part, to the misapplication of Air Force assets. Airpower's much sought-after success as a psychologically coercive weapon went undemonstrated. Worse, whatever its potential, U.S.A.F.

airpower was frequently squandered in on-again off-again campaigns. Ludicrous target limitations and unresolved doctrinal issues similarly caused problems in its ultimate application and efficacy.⁴ Despite all of this, however, even the War in Vietnam witnessed an extraordinary glimpse of the true efficacy of airpower with the Linebacker raids over Hanoi.⁵ And the commitment, bravery, and determination of U.S. airmen remained unquestioned.⁶

The events of the recent Gulf War have brought the potential of airpower into renewed focus. During a forty-three day air campaign Allied aircraft flew more than 100 thousand sorties and gained total air supremacy in less than ten days. The Iraqi army was largely destroyed in place. So impressive was this performance that it led the Air Force's Chief of Staff, General Merrill McPeak to suggest that DESERT STORM marked "the first time in history that a field army has been defeated by airpower."⁷

Whatever the war or campaign, the achievements of airpower always come at some cost. During the Second World War, just in the European Theater, men from the United States Eighth Air Force sustained combat casualties which approached sixty percent of their aircrew strengths. More than 8,000 U.S. aircraft were lost and about 26,000 American airmen gave their lives. At least 3,000 lie in unknown graves or in the sea.⁸ Even the limited war in Korean War saw more than 3,000 American aircraft destroyed to all causes. Allied casualties exceeded 1,800 airmen.⁹ And the

results of the Vietnam War were just as grim. Three-thousand two-hundred fixed-wing aircraft were lost in connection with the conflict and an almost equal number of U.S. airmen gave their lives or were imprisoned.¹⁰ The air war against Iraq proved a dramatic exception to the trend in high aircraft losses. For a variety of important and complex reasons Allied losses were tiny compared to the effort expended. Only 41 fixed-wing airplanes were lost, and only 29 of them were American.¹¹

However dramatic or tragic, combat statistics alone cannot possibly tell the whole story of history's various air offensives. In other words, the results of these air campaigns cannot be measured merely by the number of sorties generated, bomb totals, targets destroyed, aircraft losses, or victory tallies in air to air combat. Although air war employs scientific and technical means to a greater extent than had ever been seen previously, its results nevertheless still rest on the individual courage, stamina, and determination of thousands of men and women. These are the human qualities, above all others, that air war seems to demand.

The reasons for this are apparent from the nature of the conflict. If one accepts the Clausewitzian notion that countless minor and unpredictable factors can cause things to go wrong in war, it follows that courage, determination, and stamina -- which together might be characterized as willpower -- help overcome these impediments to success.

According to Clausewitz, however, attempts to overcome the friction of war eventually take their toll on combatants.

Understanding the human stresses of combat is therefore an essential way to frame any understanding of airpower.

Too often campaign summaries, personal memoirs, biographies, and aircraft monographs tell us little about the real nature of air combat or its impact on its participants. Vivid and graphic recollections of dogfighting at 25,000 feet, stories of individual heroism, or descriptions of crashing aircraft and exploding bombs make riveting reading. But, in a very real sense, they do not speak completely to the fullness of the air combat experience; to do so requires consideration not just of the physical but also the mental world of air battle. Official attention needs to be more closely focused on the psychological dimension of air campaigns, especially topics which relate to aircrew reaction to combat, adaptability to stress, morale, and the role of leadership in recognizing and dealing with aircrew combat fatigue. The fundamental purpose of research in these areas is to make up-to-date training and education recommendations to the United States Air Force. Despite the huge importance of the human dimension of air war, current U.S.A.F. operational commanders receive little or no systematic training relating to their roles in the avoidance, identification or treatment of aircrew psychological casualties.¹²

This monograph uses the historical method to address the subject. It begins with a brief look at the

characteristics of airmen as they have been seen over time. After subsequently introducing the risky nature of the air combat environment, it moves on to describe some of the manifestations of stress. Further sections review Air Force policy regarding aircREW psychological casualties as it has developed since the years of the First World War. The final parts of the study make direct recommendations for the future education and training of Air Force operational commanders.

CHARACTERISTICS OF AIRMEN

Almost from the beginning of aviation, airmen have been regarded as members of an elite group. Much of this view arose as the result of the dangers associated with flying. In the early part of the twentieth century, flimsy machines, unreliable engines, and inadequate preparation caused scores of accidents. Airplanes and flying were considered novelties, and pilots were often seen as daredevils. In the view of many, it took a special type of man to brave the obvious perils.¹³

This image became even more exaggerated during the First World War, especially in the popular perception. Circumstances combined to generate the favored notion that aviators were somehow "super-men" who not only had nerves of steel, but also were physically and mentally superior. The reality was much different, of course, but elements of this

attitude were common even inside military services and persist even today.

As an example, press reports and pulp fiction novels had little difficulty glamorizing the character and exploits of World War One fighter aces. Perhaps mindful of these heroic qualities, military commanders and aviation-medical authorities settled on the necessary prerequisites for successful flyers. Additionally, the intensity of aerial combat operations from 1914 to 1918 along with rapidly advancing aircraft technology made it clear, at an absolute minimum, that a robust emotional constitution was necessary for an aviator's success and survival. Fixed physical standards were therefore supplemented by detailed personal characteristics which gave clues to a flyer's temperament.¹⁴ Eagerness to fly counted for much, as did youth, resolution, tenacity, and a willingness to take risks. Each of the war's belligerents adopted some form of this formula to find suitable flying candidates.

By the start of the Second World War, these notions had become widely institutionalized. At the same time, the American approach to aircrew selection and classification reflected a strong faith in the scientific method of evaluating human capabilities. Reception centers subjected new recruits to a daunting series of physical and mental tests designed to measure general intelligence, mechanical aptitude, and probable speed of learning. For these tests to work properly it was obviously necessary for military and

medical authorities to predict what kind of skills would be necessary for successful pilots, navigators, bombardiers, radio-operators, and gunners to employ. Psychologists and psychiatrists worked closely with training officials and instructor pilots to create such a list. Among the most important predictors of success were the ability to perceive and react to stimuli, adequate muscular coordination, the skill to visualize mechanical movements, and adeptness at discriminating between visual objects.¹⁵

As in earlier the conflict, aviators' optimum physical attributes were supplemented by mental characteristics. The wartime picture of the ideal fighter pilot was of a young, aggressive, and very fit aviator who was capable of quick and decisive actions. Moreover, his motivation for combat was very high. A spirit of youthful adventure was considered helpful, as was a certain devil-may-care attitude. World War Two commanders considered the best age for fighter pilots to be about 22 years old.¹⁶

Discussions between commanders and medical authorities of that time yielded a slightly different picture of the optimum bomber pilot. He was a slightly more mature individual, who would likely remain steady and cool in combat. Reliability and dependability -- making the right decision and using good judgment -- were considered more important than doing something too quickly. Bomber pilots typically had more responsibilities than did their fighter pilot counterparts. The complexities of flying multi-engine

aircraft and coordinating the activities of other crewmen demanded a steady and firm hand.¹⁷

Good navigators and capable bombardiers on bomber planes were likewise noted for their dependability, judgment, emotional control, as well as their powers of orientation and observation. Radio-operators and gunners needed more mechanical aptitude and were often considered better if they were much older and more responsible.

These generally accepted concepts changed little during America's next conflict. The Korean War did, however, see a slight alteration in the overall complexion of the aircrew force. Many Korean War airmen, if not the outright majority of those who fought, were World War Two fliers who had been recalled from civilian life. Many too were quite bitter about having their careers interrupted, and, according to at least two sources, were less committed to the effort, and had less motivation to fly in combat.¹⁸

The airmen who fought in Vietnam continued to reflect changing demographic trends. As a result of changes made in selection criteria during the 1950s, the majority of Vietnam era airmen had earned undergraduate diplomas and commissions from the Reserve Officer Training Corps or the Air Force Academy. Many more had gone on to obtain Masters degrees. The youngest among them still reflected at least five years of education and training, while there were many career officers with families who were in their 30s or 40s. Scores of the latter had several thousand hours flying hours and

even served multiple tours. In sum, it is fair to say that the combat airmen over Southeast Asia were largely more mature, better trained, and certainly more experienced than the huge majority of their World War Two and Korean War counterparts.

This trend has continued to the present day although the differences between the warriors of Vietnam and those of the Persian Gulf are probably not as great. Today's airmen nevertheless benefit from more sophisticated training programs and deal with a level of technology which was only a distant dream during the 1960s and early 1970s.¹⁹ These factors reemphasized the necessary and unchanging characteristics of good airmen -- physical conditioning, aggressiveness, mental agility, and reasonable coordination. In addition to these, modern analysis speaks to the ability of airmen to fly their aircraft and react to outside stimuli in terms of situational awareness.

Although situational awareness -- or "S.A." as it is popularly called -- is a relatively innovative term, it is certainly not new to aviation. First and Second World War veterans often spoke of "being on top of the situation."²⁰ The most successful airmen of any conflict, and especially in today's high-speed, high-tech environment, are able to maintain situational awareness and avoid task saturation, despite the multiple mental and physical demands of a combat situation. Moreover, they are able to overcome the paralyzing panic that sometimes comes with being at

momentary disadvantage in any combat situation. Given the opportunity, these are usually the kinds of men who either hit their targets or score victories in the air.

Without exploring the full complexities of human psychology, it is nevertheless apparent to medical specialists that many successful aviators share certain personality traits. In the simplest terms, these are said to include -- among other things -- a strong narcissistic component, an abundance of confidence, a drive to be in control, and easy-going sociability.²¹ These characteristics are important to keep in mind as we continue our look at the human dimension of air combat.

RISK AND THE NATURE OF THE AIR COMBAT ENVIRONMENT

The environment of air combat is largely unique. As we have read, Clausewitz argued that all war takes place in an atmosphere of danger, physical exertion, uncertainty, and chance -- and that together these constitute "friction."²² If this is true, in the air these factors seem magnified many times. In other words, because flight itself can be considered to be conducted in an essentially hostile environment, the concept of friction has a much expanded meaning for airmen.

A principal reason for this is that airmen, unlike most ground soldiers, are sustained in their fighting environment by what are essentially artificial means. Without aircraft

to carry men aloft, without life-support equipment to keep them warm and breathing, and without relatively sophisticated weapons, no fighting could take place in the skies above the ground. Such fundamental reliance on mechanical support only increases the potential that something can go wrong. And when they do -- as when airplanes have to be abandoned due to enemy action or mechanical failure -- airmen are often not safe until returned to earth by parachute. Thus, airmen, more than many other wartime combatants, have to deal not only with the Clausewitzian challenges of combat, but also face the life-threatening hazards of nature's surroundings.²³

This idea is important to any understanding of the human dimension of air combat. In very real ways friction dominates the efforts of airmen from the moment of take-off to mission end. It comes as no surprise that military authorities -- assisted throughout history by scientists, doctors, engineers, and manufacturers -- have expended considerable effort to minimize the impact of friction on operations, and although rarely couched in Clausewitzian terms, these efforts were clearly directed to improve an airman's combat effectiveness.

With all of this in mind, it is useful to examine Clausewitz's factors separately and consider their impact on the physical and emotional state of airmen. Hundreds of factors, for example, combine to increase the atmosphere of danger within which airmen have to operate. Quite apart

from the already considerable physical threats of violence, wounds, or death that any combatant faces in battle, airmen assume the routine but serious risks of aerial flight.

In this regard, advancing aircraft technology levies a human price. Major advances in aeronautical design, metallurgy, engines, electronics and weaponry have led to the swift introduction of more and more sophisticated combat aircraft over the years. But these more complicated aircraft systems -- even if they are safer -- frequently demand better trained and more intelligent operators. Moreover, higher aircraft performance puts more strain on life-support and, fundamentally, on aircrew physiological capabilities. In other words, fast, high-flying airplanes potentially put their occupants in more danger and for longer periods than in any time in aviation history.²⁴ Even sophisticated equipment can break-down.

After equipment and combat associated problems, among the more dangerous challenges to airmen are weather and general flying safety risks. Weather related accidents have been common in aviation history. Despite quantum jumps in safety related technology and cockpit instruments, modern aircraft are still vulnerable to poor atmospheric conditions. Thunderstorms and icing are among the leading dangers, as are restricted visibility, strong winds, freezing rain, turbulence, haze, and fog. General flying safety risks are likewise important. Better training programs notwithstanding, aircraft operator error is

responsible for a huge number of accidents. Failure to follow operating procedures, over-confidence, misinterpretation of instruments, or downright recklessness have taken a steady toll of airmen from the dawn of aviation.²⁵

It is the atmosphere itself, however, which gives air combat much of its unique nature and increases the impact of Clausewitzian physical exertion and uncertainty. The salient feature of the air battlefield is its almost limitless size and scope. Modern aircraft have ranges which extend nearly to the limits of human endurance. It is no longer unusual for missions to last several hours in duration. For most aircrrew there is virtually no time to relax on a mission, especially one in combat. The normal mental demands of flying are therefore labor enough, but to these must be added the considerable exertion required to overcome extended periods of noise, vibration, and gravity forces. And airmen in combat must remain vigilant for the enemy.

The modern air battlefield can be particularly daunting. The number of threats faced by any aviator has increased exponentially since the end of the Second World War. Today's missions must be accomplished in an arena which features the risk of death at almost every turn. Airmen must not only overcome the potential for chemical, biological, or even nuclear weapon attack, but also remain vigilant for enemy action from every quarter. Despite the

help of human engineered cockpits and threat warning instruments, pilots on combat missions are required to receive and process huge amounts of information in very brief amounts of time. Sophisticated electronic warfare capabilities alongside increasing numbers of highly accurate air and ground-launched missiles guarantee a potentially lethal environment.²⁶

One of the more dynamic features of the air combat environment relates to the impact of chance on flight operations. Aviators normally have been subjected to considerable training from the very beginning of their service. Indoctrinated by a flying philosophy which rightly suggests that hard training makes for easier operational missions, most airmen work diligently to improve flying and combat skills. To a very real extent, however, many of the losses in air combat are due strictly to the misfortunes of war. Aircraft or equipment malfunctions claim many who are absolutely on the top of their form. Casualties in air war often appear to strike at random. The unpredictable meeting of aircraft and enemy in thousands of square miles of airspace often cannot be reckoned with. Aircraft have disappeared or crashed, and airmen have been killed for no discernable reason. Aircrews throughout history have been aware of this randomness and the corresponding heightened importance of chance. So the response of the most successful has been directed toward enhancing their odds

slightly by hard training, teamwork, and painstaking attention to detail.

ANXIETY AND STRESS IN AIR COMBAT

It is clear that the unique characteristics of the air combat environment can place extraordinary strains on airmen. But like soldiers throughout the centuries, airmen are required to adapt to the startlingly new experiences of combat. As we have seen, the air combat environment is often overwhelmingly demanding and life-threatening. The physical challenges often seem intolerable and the pressure to perform relentless. For many in the history of air war the only tangible reward was survival; yet statistics frequently showed this to be mathematically almost impossible.²⁷

Under these kinds of circumstances, it is little wonder that men are rendered vulnerable to the physical and mental symptoms of stress. In many ways, and for many airmen, just staying in combat means fighting and winning a personal battle, the full extent of which becomes all too clear soon after arrival in a combat flying squadron.²⁸

We have already noted some of the physical exertion to which airmen are subjected. All of these take a toll on aircrew stamina. And while the physical stresses of flying normally remain well within limits for the vast majority of aviators, the most significant impact of this repeated

strain is the additional burden it imposes on the emotions. Throughout history, aviation medical authorities have been careful to note the impact of fatigue on airmen, especially as it adds to their level of anxiety.

In addition to the pure physical fatigue it causes, flying is normally accompanied by some apprehension, even in the most seasoned aviators. Quite apart from enemy action, operational conditions are enough to increase any man's fears. Night flying or flying in bad weather causes understandable levels of anxiety. Fear of the unknown is a constant companion. But to these elements others must be added.

Even without hard data, for example, it is widely postulated that married airmen, and airmen with sweethearts, can be subject to more unease than are many bachelors -- if only because they are worried about what might happen to their spouses if they are killed or go missing. Moreover, the U.S. Air Force recognizes that a variety of domestic factors, including financial difficulties, pregnancy, illness, and divorce add to a man's concerns.²⁹

It follows that a normal amount of tension is present on almost any air combat mission from the beginning. Briefing rooms often reflect a quiet apprehension and the hours spent in mission preparation are sometimes marked by unbearable strain. Moreover, some veterans have reported

that the worst feeling of all is occasioned by hours of anticipation leading to last-minute cancellations.³⁰

Flying a combat mission and the necessity of performing one's duties tends to keep airmen occupied while actually in the air. But the length of missions contributes to the general state of anxiety, especially if extended periods of time are spent over enemy territory or targets. To this must be added terrors over the state of enemy defenses. Each airmen normally has his own list of specific fears. Some are most concerned about anti-aircraft artillery, some fear surface-to-air missiles, and some dread enemy fighters.³¹ Any lethal combination of these weapons causes understandable tension and anxiety.

Air war in the post Cold War era brings special challenges. Because it is likely that American forces will be deployed some distances to a combat zone, tanker and transport aircrues will also be subjected to many of the same strains as traditional combat aviators. Moreover, given the long ranges of fighter interceptors and missiles systems, all those airmen who might not normally be considered at risk will essentially be in the front line. It is worth noting also, that air bases themselves -- most often safe havens in the U.S. Air Force's previous wars -- can potentially be subjected to repeated and devastating attack.³²

In sum, airmen -- those flying or those supporting flights -- are not truly safe at any moment from deployment

through take-off to landing in a combat theater. Even when not directly attacked on the ground, there is evidence that the alternating nature of air war increases the strain on an airman's personality. American combat veterans often recall the unreality of returning to peaceful air bases and billets after spending agonizing minutes over Germany, the Yalu, Hanoi, or Baghdad. Many of them were able to spend a few hours of relative comfort, and a few might have stolen some precious time with family, wives, or sweethearts. Afterwards they would find themselves right back up in the air facing the same daunting odds they had on the previous mission. The toll on the human psyche for such an "on again, off again," war is immeasurable.³³

The fundamental cause of anxiety is almost certainly a flyer's instinctive fear of failure, death, maiming, burning, or capture. It is an airman's emotional reaction to these possibilities that produce the symptoms of stress. In a widely accepted view, there are certain mechanisms which defend a man from excessive stress. Among these are his sense of patriotism, his understanding of why he is fighting, his pride in his unit, the quality of his leaders and equipment, and his ability to identify with his comrades.³⁴ Against this is the often overwhelming sense of fear engendered by the visible impact of physical harm or death. In short, airmen react to the conflict between their desire to do their duty, and thereby maintain their self-respect, and their instinct for self-preservation.³⁵

THE MANIFESTATIONS OF STRESS

Stress, primarily in the form of fatigue and fear, can take a measurable emotional toll on airmen. It is not unusual for the abnormal stresses of flying and combat to lead to excessive anxiety. This, in turn, has the potential to cause genuine symptoms of emotional disorder as some percentage of airmen -- however small -- are unable to adapt efficiently to the demands placed on their personalities.

For operational air force commanders, defining the exact nature of these disorders is less important than correctly identifying some of their visible signals and understanding how to deal with them. In general terms, the symptoms of aircrew emotional disorder can be categorized in several ways. First, there are symptoms which openly demonstrate the effects of emotional tension. These might include changes in appearance, talk, or behavior. Among the more discernable are weight loss, aggressiveness, irritability, insomnia, excessive use of alcohol, startle reactions, or even hyper-sexuality.³⁶

A second general category of distress might reflect deeper and more severe problems. At this level some aircrew suffer a serious loss of keenness for flying duties, mental confusion, erratic behavior, melancholic states, guilt or subsequent depression. In addition to all these signs, it is not unusual, by any means, for airmen in combat to show

other physical reactions to severe anxiety. Air-sickness, headaches, backaches, and various stomach ailments are not uncommon.³⁷ Sick-call rates throughout history are known to increase with higher casualties, but this does not mean that men will fake illnesses. In fact, despite worsening states of health during air combat tours, aircrack actually appear less inclined to report themselves sick.³⁸

Finally, when the physical symptoms of anxiety get bad enough, they might result in shakes, tremors, muscular rigidity or some other visible -- yet apparently non-organic -- physical phenomena. Rarely, there might even be dramatic cases of paralysis, blindness, or catatonia. Thankfully, these conditions are comparatively rare.³⁹

It is important to note that none of the responses to excessive stress are considered mutually exclusive. Aircrack subjected to terrific levels of strain might show symptoms from more than one category of disorder. For many men, periods of intense activity inevitably accentuates the symptoms resulting from fatigue and fear. On the other hand, rest and relaxation just as often bring a corresponding reduction in the strains. According to the best evidence collected over the history of air war, virtually all flyers suffer some of the effects of fatigue and fear.⁴⁰ But emotional casualty statistics confirm that the overwhelming majority of men win their battle to stay in combat -- even if faced with setbacks from time to time.

THE AIR FORCE AND PSYCHIATRIC CASUALTIES

It should come as no surprise that the U.S. Air Force's current views on the subject of psychiatric casualties in air war come as a result of historical experience. It was during and just after the First World War that the topic received much of its early attention. Ground soldiers of that time who showed evidence of strong emotional disorder were said to be suffering from "Shell-Shock." This notion, which rested on the premise that there was a simple physical explanation for the symptoms of stress, gained popular acceptance. The intense shell-fire of World War One was thought to cause brain concussion and contusion. These factors, in turn, were assumed to cause the mental abnormalities in some veterans. Fortunately, research between the wars began to show the true nature of emotional disorder. Even so, various authorities -- both inside and outside the medical community -- believed that certain men were immune from any of these difficulties, whatever the cause. General "Blackjack" Pershing was so convinced that he helped mandate the careful, scientific screening process described in an earlier part of this report.

As the United States entered the Second World War there were many who believed that the Air Force's deliberate pre-selection of candidates, careful testing, and elaborate training had virtually eliminated the potential for emotional casualties. By 1943, however, these overly

simplistic ideas had been dispelled. High aircraft losses in the Eighth Air Force were matched by significant increases in the numbers of airmen unable to continue to fly for emotional reasons.⁴¹ While these casualties never prevented overall mission accomplishment, it nevertheless quickly became apparent that "every man had his breaking point." In sum, American authorities recognized that emotional breakdown could happen to anybody, not just the "weak" and predisposed.⁴²

The recognition of this fact led to policy developments which exist to this day. Operational tour limits are one of the most significant. While they varied from theater to theater, during the Second World War twenty-five to thirty missions constituted a typical bomber tour. Fighter pilots were usually required to fly no more than 200 hours of combat time.⁴³ Limits in Korea were roughly the same. And during Vietnam, one hundred missions was the initial standard, but this eventually gave way to one year tours.⁴⁴ Whatever the exact requirement, commanders exercised a method to limit the combat exposure of any airmen within definable boundaries. It not only gave crewman a goal to attain, but it helped prevent excess strain. In some cases tour limits also gave airmen a reasonable chance of survival.

Over the years, American airmen have seemed comfortable with what has come to be a relatively permissive policy toward the question of combat stress and its results. Even

the terminology associated with emotional disorders has reflected the reluctance to stigmatize men suffering from its affects. During the Second World War and the Korean War, for example, the Army Air Forces used terms like "operational fatigue" and "operational exhaustion."⁴⁵ These terms clearly connoted the physical strain on aircrew. So by using these descriptors, and thereby avoiding easily misunderstood medical terms, it was hoped that airmen would be less inclined to see themselves as "crazy." Recently, medical authorities have become more accustomed to using terms like "combat stress reactions," "battle-shock" or "post traumatic stress disorder" to describe the same general phenomena.⁴⁶ Whatever the terminology, the idea seems to be to convince commanders -- many of whom may remain sceptical of permissive medical diagnosis -- that the occurrence of emotional casualties is the natural result of war itself. In short, the appellation given to the state of these airmen is intended to indicate that they are sick, that they are recoverable, and that they are certainly not shirkers.⁴⁷

An important and sensitive question over the years has been how to differentiate between the truly sick and those who might simply be trying to avoid combat. At various times in the history of air combat this question has been addressed -- often without successful resolution. It seems clear from the evidence of previous wars that the total of airmen who might pejoratively be dismissed as "cowards" has

been extraordinarily small. Despite this, there have been a number of cases which fall uncomfortably between the limits of emotional disorder and simply bad morale.

The connection between morale and emotional disorder is doubtless a complex one. Combat airmen are motivated by a wide range of emotions. Undergirded by an understandable sense of patriotism and duty, many display a youthful affection for flying. Specially selected, reasonable well-trained, fit, and assigned elite status, most begin their missions confident that the part they are playing is an important -- if not the most important -- part in winning any conflict. They are prepared to make great sacrifice, if what they are doing seems worthwhile and has a reasonable chance of success. If, however, losses seem to come for no real gain or a particular series of missions seem foolish in the extreme, morale usually suffers.⁴⁸

It follows that flyers are generally sustained by decent leadership because incompetent and poor commanders usually do not last long. There are times during an air campaign when morale comes under the most pressure, but these generally correspond with intense and sustained operations marked by much higher than normal casualty rates. As with their ground soldier counterparts, the principal reason most airmen stick things out in combat appears to be the spirit of cohesion and teamwork that permeates units and individual aircrews. If asked why they have faced the often terrible odds against survival, most would probably say, "I

cannot let my buddies down."⁴⁹ At the same time, aviators expect courage, competency, and compassion from their leaders at all levels.

THE ROLE OF LEADERSHIP

If there is a lingering potential for conflict on the issue of emotional casualties it comes as a result of the lack of education and training operational commanders now receive on the topic. Air Force flying officers at all levels are well versed in the physiological stresses of flying. From among other places, this knowledge comes from the continuing requirements for altitude chamber qualification. Such training sessions are almost always accompanied by classroom briefings on various aspects of stress as it relates to flying safety. Much of the material is insightful, up-to-date, and designed to improve an aviator's knowledge of his own limits and capabilities. But these classes seldom if ever mention combat stress or its associated problems.

Current Air Force flying regulations or policy letters are virtually silent on the subject. Although medical literature on the topic is large enough, no direct guidance has existed for commanders since the end of the Korean War. And while it should be noted that a variety of procedures are codified for removing an aviator from flying duty -- such as Flying Evaluation Boards and medical reviews --

these approaches have been designed for problems which typically arise from peacetime situations.

As a result of this lack of background, contemporary U.S. Air Force commanders risk being not appropriately equipped to deal with the potential of aircrew emotional casualties. When the situation actually occurs, as it has as recently as DESERT STORM, Air Force commanders are often forced to rely on little more than their own intuition, compassion, or gut-instinct.⁵⁰

This is not to say, by any means, that commanders cannot turn for counsel and advice to flight surgeons or chaplains. In fact, the history of the Air Force demonstrates that there is no more important relationship to monitoring a combat squadron's morale than that between the commander and his flight surgeon. When used most effectively, flight surgeons not only treat the sick and injured of the squadron but can also serve as the commander's "eyes and ears" regarding morale and the general welfare of his aviators. Chaplains likewise can be extraordinarily effective in this regard. Depending on circumstances, they can make the difference between a commander out-of-touch and one truly knowledgeable about the needs of his men and women.

Across the span of the U.S. Air Force's combat experience, it seems clear that many commanders have dealt with the entire question of emotional casualties with some discretion and quiet compassion. The evidence beginning

with the Second World War supports this conclusion. In the 200,000 man Eighth Air Force, for example, there were no more than 1000 cases of emotional disorder -- either temporary or of the kind that required permanent grounding -- per year. The huge majority of these were successfully identified and treated locally, on the affected aviator's own flying station and by his own flight surgeon.⁵¹ While it should be noted that there were occasional administrative punishments for men who appeared to refuse to fly without cause, these actions were comparatively rare.

The same situation largely exists today. It should come as no surprise that during DESERT SHIELD and DESERT STORM there is evidence that a small fraction of aviators showed classic signs of aircrew combat fatigue.⁵² Moreover, while understandably not a part of any easily obtainable record, there also appear to have been isolated cases where certain airman made it clear that they preferred not to fly in combat. As with the Air Force's previous air campaigns, commanders dealt with these questions largely without the assistance of any formal written guidance.

Commanders have always had the authority to remove a man temporarily from flying when it becomes apparent that, for whatever reason, he seems unable to contribute safely and effectively to the mission. As we have seen, the best commanders are generally well-connected to their aviators and usually spot men long before a serious problem develops. The same was true at the air bases in Saudi Arabia. DESERT

STORM veterans indicate a variety of tried and true methods were employed to ensure a high standard of physical and emotional fitness was maintained during the forty-three day campaign. These methods included occasional breaks from flying, brief periods of leave, and frequent telephone contact with friends or loved ones at home. Some combat squadrons even had elaborate family support arrangements at their home stations to help support morale.⁵³

On the subject of what to do with the rare case of someone who could not or would not fly, DESERT STORM commanders appear to have responded in ways not unlike their World War Two, Korean, and Vietnam War predecessors. Some of the men in question never deployed with their units. Others were quietly pulled from flying operations. Few commanders seemed ready to sacrifice the career of any aviator based on anything but the most concrete grounds. For completely understandable reasons, commanders were not prepared to take actions which might result in harsh penalty.⁵⁴

For many commanders the pivotal determination in such cases is whether or not the man has "done his fair share," or "shouldered his load." Not surprisingly, perhaps, those who break-down after particularly harrowing circumstances can expect to be treated with greater leniency. But stronger administrative actions are available -- presumably including even court martial -- for those who are considered to be dodging responsibility. Contemporary combat veterans

express views virtually identical with their earlier twentieth century predecessors. No airmen, in their strongly expressed opinions, should appear to be rewarded for his failure to fly. Morale in the unit would suffer as a result.

The most up-to-date medical approach to combat fatigue problems similarly relies on a series of tried and true notions. Airmen who have been identified -- one way or another -- with stress related problems can be sent a central base stress facility. This treatment location may be isolated to some extent from the unit's other medical activities. While early in the process the commander and flight surgeon will make critical determinations about the airmens' ability to fly, treatment at the stress facility will largely be in the hands of mental health specialists.

The most important element in any treatment of combat fatigue is to give the patient the expectation that he will return to full duty in a very short period of time. Accordingly, treatment can be summarized by the term BICEP. The "b" in BICEPS stands for brevity, which usually extends only from one to three days of treatment. "I" stands for immediacy, which calls for treatment just as soon as the problem is identified. "C" connotes centrality and speaks to the importance of a single location for treatment. The "e" underscores the fundamental idea that a flyer can expect to return to combat duty. And the "p" reminds us that it is vital to treat the airman in close "proximity" to his

unit.⁵⁵ This reinforces the cohesive spirit so vital to morale and combat effectiveness.⁵⁶

WHAT IS STILL NEEDED

The most important element in this entire question is education. Despite the sympathetic and generally effective treatment accorded those few who suffered from combat fatigue over its history, the Air Force would be better off if airmen and commanders alike were more educated on the subject. In this regard, the Air Force should develop and codify a coherent policy relating to combat stress and its impact. Data should be collected, preserved, and evaluated. Commanders and medical authorities need to work together to illuminate a subject that sometimes seems too deeply obscured. Combat fatigue and all stress related subjects need not be whispered about or regarded with excessive sensitivity. They are clearly part-and-parcel of modern air combat.

It follows that commanders must be armed with information and knowledge. They must be well-versed on the most effective leadership steps to minimize the potential impact of stress or stress related casualties. Flyers most often respond to combat commanders who display intelligence, courage, compassion, and competency. It would be a mistake to educate and train commanders in each of several mission complex areas while ignoring the human dimension of combat.

And yet, in some measure, this is what we have done up to now.

Commanders need to know how to best use their flight-surgeons in combatting the potential impact of combat stress in any Air Force unit -- flying or otherwise. While certainly not physicians themselves, these same commanders need to be reasonably well-versed in the causes and cures of combat stress related disorders. Simplistic ideas and bigoted views which continue to categorize all those affected as cowards and shirkers are seriously out of touch. Those leaders in mid-level and senior positions of responsibility must understand the key role of the flight surgeon in the prevention and identification of stress. Moreover, it is necessary to be familiar with the administrative procedures which can be used to deal with cases not falling into medical categories.

In a direct sense the Air Force needs to expand the deliberation on this topic. In my view, the two fifty-minute lectures at Maxwell A.F.B. currently offered are insufficient to reach all of those who may be called upon to face combat in the future. Brief discussions of the topic can begin as early as basic training and extend to technical and pilot training bases. Moreover, formal P.M.E. -- at Squadron Officers School, Air Command and staff College, and the Air War College -- must address the topic in a deliberate and systematic way. Future commanders must be compelled to examine past policy and debate current Air

Force practices. These forums would allow the kinds of in-depth discussions necessary for deeper understanding. In sum, aviators and ground personnel of all ranks should be exposed to an appropriate level of schooling.

The potential for future conflict has not gone away. While it is dangerous to draw any concrete lessons from recent history, DESERT STORM would nevertheless seem to indicate that airpower will continue to play a very important -- if not **the** most important -- role in modern war. As in the deserts over Kuwait and targets over Iraq, combat airmen of the future will very likely find themselves in incredibly chaotic and stressful conditions. In the long run, their insight and understanding of their own reactions may be the key to increasing their combat effectiveness.

ENDNOTES

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2 Robert F. Futrell, The United States Air Force in Korea 1950-1953 (Washington: Office of Air Force History, 1983), 689-692.

3 "U.S.A.F.'s First Twenty Years," Air Force Magazine (September 1967): 99.

4 Major Mark Clodfelter, U.S.A.F., The Limits of Airpower (New York: The Free Press, 1989), 203-210.

5 Robert F. Dorr, Air War Hanoi (London: Blandford Press, 1988), 180-185.

6 James R. Schlesinger, "A Message About Vietnam," Supplement to the Air Force Policy Letter for Commanders (Washington D.C.: July, 1976): 6.

7 Quoted by Michael A. Palmer, "The Storm in the Air: One Plan, Two Air Wars?" Air Power History 39 (Winter 1992): 31.

8 No completely accurate casualty count exists. See Douglas D. Bond, The Love and Fear of Flying (New York: International Universities Press, 1952), 7; Roger A. Freeman, The Mighty Eighth (London: Jane's, 1986), 238-265; and "The Reclassification of Personal Failures in the Eighth Air Force," 16 October 1944, 520.742-4, Air Force Historical Research Agency (hereafter AFHRA).

9 Futrell, 392.

10 M. J. Armitage and R. A. Mason, Air Power in the Nuclear Age (Chicago: University of Illinois Press, 1983), 113.

11 First Lieutenant Matthew M. Hurley, U.S.A.F., "Saddam Hussein and Iraqi Air Power," Airpower Journal VI (Winter 1992): note 1, page 14.

12 Surprisingly, the topic is not addressed at any commander's course or at the senior level of the Air Force's professional military education program. Dr. David R. Jones, M.D., U.S.A.F. (retired) delivers a fifty minute

lecture to junior officers at Squadron Officers School and to majors at the Air Command and Staff College. For an example of the curriculum at the senior officer level see Directorate of Associate Programs, Program Guide: Air War College, 2nd ed. (Maxwell A.F.B.: Air University Press, April 1991), 3-4.

13 See The New York Times, 6 November 1910, Picture Section 1.

14 Captain T. S. Rippon and E. G. Mannell, "Report of the Essential Characteristics of Successful and Unsuccessful Aviators," The Lancet (28 September 1918): 411-415.

15 Major General David N. Grant, "The Medical Mission in the Army Air Forces," in Doctors at War edited by Morris Fishbein, M.D., (New York: Books for Libraries Press, 1945), 280-283.

16 Office of the Air Surgeon, "Analysis of the Duties of Aircrew Personnel, Descriptions of Aircrew Performances from Theaters of Combat," 5 May 1943, 141.28D-10-19, AFHRA.

17 Ibid.

18 A controversial conclusion to be sure. See David R. Jones, M.D., "U.S. Air Force Psychiatry," Technical Report No. USAFSAM-TR-85-83 (Brooks A.F.B., Texas: U.S.A.F. School of Aerospace Medicine, 1986): 2; and Major Antone E. Gajeski, "Combat Aircrew Experiences During the Vietnam Conflict: An Exploratory Study," Unpublished A.F.I.T. Thesis, August 1988, 11.

19 According to one author the U.S.A.F. has developed the "most realistic and ambitious training program in the whole world." Mike Press, "The Human Factor: The United States versus the Soviet Fighter Pilot," Air University Review 38 (November-December 1986): 75.

20 For an excellent discussion on situational awareness see Mike Spick, The Ace Factor (Annapolis: The Naval Institute Press, 1988), introduction and 1-14. For comments by a World War Two fighter ace see Colonel James A. Goodson, U.S.A.F. (retired), 4th Fighter Group, to author, 21 June 1989.

21 As might be expected, there is no single, all encompassing list of attributes. For good discussions on the topic see Edward W. Youngling, et al, Feasibility Study to Predict Combat Effectiveness for Selected Military Roles:

Fighter Pilot Effectiveness (St. Louis: McDonnell Douglas Corporation, 1977), 3-23 to 4-6.

22 Carl von Clausewitz, On War, edited by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 104-121.

23 A similar analysis might be extended to naval combatants, especially submariners, who, like airmen, are mechanically suspended in an environment incapable of sustaining human life by itself. It is especially striking too that of all of World War II's combatant forces, only German U-boat crews suffered casualties comparable to Allied airmen. See Timothy P. Mulligan, "German U-boat Crews in World War II: Sociology of an Elite," The Journal of Military History 56 (April 1992): 261-281.

24 See Marvin Leibstone, "Human Factors and Cockpit Technology," Military Technology 7(July 1988): 69-75; and Clement D. Urban, "The Human Factor," Proceedings (October 1988): 58-63.

25 Huge advances in overall aircraft reliability do not guarantee safety. Experts are still warning that human-factor accidents will increase. See David Learmont, "Human Factor Holds," Flight International (22-28 November 1989): 24.

26 Major Michael J. Foley, U.S.A.F., "Combat Stress and its Impacts for Fighter Squadron Commanders," Report Number 88-0940, Air Command and Staff College, Maxwell A.F.B., Alabama, 13.

27 During periods of World War II's Combined Bomber Offensive, fewer than one-third of Allied airmen were surviving 25 or 30 mission tours. For supporting data see "Statistical Summary of Eighth Air Force Operations, European Theater, 17 August 1942 - 8 May 1945," 520.308-1, AFHRA; Martin Middlebrook, The Bomber Command War Diaries (London: Viking Books, 1985; London: Penguin Books, 1970), 707-710; and "Trend of Losses Related to Combat Crew Experience, Heavy Bomber Operations," circa February 1944, 519.7411-1, 1943-1946, AFHRA.

28 Roy R. Grinker and John P. Spiegel, Men Under Stress (London: J. and A. Churchill, Ltd., 1945), 36.

29 Aviators routinely receive briefings and brochures detailing the impact of stress during their periodic physiological training sessions. For a typical example see

U.S. Department of Health, Education, and Welfare, "Plain Talk about Stress," (Rockville, Maryland: U.S. Public Health Service, n.d.): 1-15.

30 This view is shared by air combat veterans of virtually every war. Among others see interview with General Theodore R. Milton, U.S.A.F. (retired), U.S.A.F. Academy, 28 October 1991; Gajeski, 41-42; and Miles Tripp, The Eighth Passenger (London: Heinemann, 1969), 37.

31 James R. Rundell, M.D., U.S.A.F., et al, "Combat Stress Disorders and the U.S. Air Force," Department of Psychiatry, Uniformed Services University of the Health Sciences, manuscript for publication, 3 May 1989, 4-5.

32 Major Price T. Bingham, U.S.A.F., "Fighting From the Air Base," Airpower Journal (Summer 1987): 32-41.

33 Documented during World War Two by American and British flight surgeons. See Dr. Douglas D. Bond, The Love and Fear of Flying (New York: The International Universities Press, 1952), 80.

34 Frederick J. Manning, "Morale, Cohesion, and Esprit de Corps," in Handbook of Military Psychology ed. R. Gal and A. D. Mangelsdorff (London: John Wiley and Sons, Ltd., 1991): 456-458.

35 See Jon A. Shaw, "Psychodynamic Considerations in the Adaptation to Combat," in Contemporary Studies in Combat Psychiatry ed. Gregory Belenky (New York: Greenwood Press, 1987), 121-125 and Dr. David Stafford-Clark, "Morale and Flying Experience: Results of a Wartime Study," Journal of Mental Science (January 1949): 10-50.

36 Rundell et al, 21.

37 Colonel William S. Mullins, editor-in-chief, Neuropsychiatry in World War II, 2 vols. (Washington: Government Printing Office, 1973) Vol 2: Overseas Theaters, edited by Colonel Albert J. Glass, 888-889.

38 Stouffer et al, 381-382.

39 Roy R. Grinker and J. P. Spiegel, Men Under Stress (London: J. and A. Churchill, Ltd., 1945): 103-104 and Richard Gabriel, Military Psychiatry (New York: Greenwood Press, 1986), 43.

40 It should be noted that no systematic attempt was made to collect or analyze U.S.A.F. psychiatric casualty data from the War in Vietnam. This was a huge opportunity that was lost. See Lieutenant Colonel Geoffrey C. Ryder, U.S.A., "Combat Fatigue Among United States Air Force Aircrew in the Southeast Asia War: A Review of Aerospace Medicine Reports," undated report, copy in author's possession, 5.

41 There was also strong evidence coming as a result of American combat infantry in North Africa, Sicily, and Italy. See Mullins, vol. 2, 111-126; and Eighth Air Force, "Veneral Disease and Anxiety Removal Rates, Eighth Air Force," June 1943 - June 1944, 519.7401-1, AFHRA.

42 Gabriel, 118.

43 Wesley F. Craven and James L. Cate, The Army Air Forces in World War II vol. I (Chicago: University of Chicago Press, 1958), 627.

44 Scores of airmen flew more than two hundred or even three hundred missions. Many more completed multiple tours in Southeast Asia as well. Interview with Colonel Howard Barnard, U.S.A.F., Army War College, 2 February 1993.

45 Terminology was a continuing problem in the Air Force. These two labels were saw widespread use and reflected ideas which were formalized by the end of the Second World War. See Eighth Air Force, "Memorandum No. 25-2, Medical Reports and Records," 12 April 1945, 520.7411-3, AFHRA.

46 Shabtai Noy, "Combat Stress Reactions," in Handbook of Military Psychology, 507-519.

47 Rundell et al, 8.

48 For data relating to the Second World War see Headquarters, European Theater of Operations, "Survey of Combat Crews in Heavy Bombardment Groups in the E.T.O., June 1944," Box 18, Spaatz Manuscripts, Library of Congress. See also Jones, 10-11.

49 The evidence on this point is overwhelming. Among others see Samuel Stouffer, et al, Studies in Social Psychology in World War Two vol. 2 (Princeton: Princeton University Press, 1949), 345-355; Manning 459-465; and Jones, 26.

50 This contrasts strongly with the situation in the U.S. Army, where, for a variety of historical and institutional

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51 Eighth Air Force, "Disposition of Combat Crews Suffering from Emotional Disorder," March 1945, 520.7411-2, AFHRA.

52 Telecon with Dr. David R. Jones, M.D., U.S.A.F. (retired), 5 February 1993; and interviews with Dr. Robert Ursano, U.S.A.F. (retired), Chief, Department of Psychiatry at the Uniformed Services University of Health Sciences, Bethesda, Maryland, 12 February 1993; and Dr. James R. Rundel, U.S.A.F., psychiatric consultant at Malcom Grow Medical Center, Andrews A.F.B., 12 February 1993.

53 A point supported by interviews with the following combat veterans: Colonel Howard Barnard, U.S.A.F., U.S. Army War College, 10 February 1993; Lt. Col. Greg T. Gonyea, U.S.A.F., U.S. Army War College, 13 January 1993; and Colonel Donn Kegel, U.S.A.F., U.S. Army War College, 13 January 1993.

54 Barnard, Ursano, Rundell, Kegel, and Gonyea interviews.

55 Noy, 514-522; McCarthy 33; Jones telecon; and Rundell interview.

56 Treatment facilities will not have a hospital-like atmosphere and patients will wear uniforms. See McCarthy, p. 34.

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